Nocturia due to polyuria presenting even in the absence of infravesical obstruction: clinical value of bladder diary

Pérez-Martínez C1, Vargas-Díaz IB2.

Abstract

Introduction: The International Continence Society (ICS) defines nocturia as “the complaint that the individual has to wake at night one or more times to void”. Nocturia affects quality of life. A bladder diary is a clinical tool that has been underused.

Objective: The objective of this study was to report the relation between 24-hour urinary volumes and nocturia in patients presenting with lower urinary symptoms.

Materials and Methods: The case records of patients presenting with lower urinary symptomatology were reviewed. Using the ICS definition of polyuria the groups were divided into the Control Group (CG): Urinary volume <2.8 l/24h and the Polyuria Group (PG): Urinary volume ≥2.8 l/24h. Data were analyzed using SPSS 10.0 software.

Results: A total of 237 case records were divided into cases and controls as follows: 29 PG (cases) with a mean age of 54.97 years (SD 15.95), mean 24-hour urinary volume (M24UV) of 3570.14cc and mean Qmax of 16.086 cc/sec. Of this group 79.31% were men (23/29) and 20.68% were women (6/29) and a total of 96.55% of these patients (28/29) presented with nocturia. 208 CG (controls) with a mean age of 49.09 years, M24UV 1499.08cc, the mean Qmax 14.456 cc/sec, 75% men and 25% women. The 88.94% (185/208) present Ni, GP 29 cases, the mean age of 54.97 years (SD 15.95) with M24UV of 3570.14 cc, the mean Qmax 16.086 cc/sec, 79.31% (23/29) men and 20.68% (6/29) women. The 96.55% (28/29) presented Ni.

Conclusion: In our series no difference statistically significant between both groups in sex.

**Urodynamics and Uroflowmetry Service. Centro de Urología Avanzada C.Ur.A. Av. Agricultura Pte. 514, Cd. Delicias, Chihuahua. Mexico. drairmavargas@prodigy.net.mx Telephone/Fax: 01639 4743676, 4725206, 4728872.
*Director of the Centro de Urología Avanzada C.Ur.A. Av. Agricultura Pte. 514, Cd. Delicias, Chihuahua. Mexico. carlosperezm@prodigy.net.mx Tels./Fax: 01639 4743676, 4725206, 4728872.
of 1499.08cc and mean Qmax of 14.456cc/sec. Of this group 75% were men and 25% were women and a total of 88.94% of these patients (185/208) presented with nocturia.

Conclusions: There was no statistically significant difference in our series between groups in relation to sex (p = 0.284) and Qmax (p = 0.16) but there was significant difference in relation to age (p = 0.0.043) and nocturia (p = 0.010). These results show that polyuria patients present with “false” nocturia in the absence of obstructive data. The probability of nocturia in the presence of polyuria was 3.48. These data can help the clinician explain to polyuria patients that their nocturia may not be related to lower obstructive uropathy.

Key words: Polyuria, Nocturia, Bladder diary, Lower urinary symptoms.

INTRODUCTION

Nocturia has been defined by the International Continence Society (ICS) as “the complaint that the individual has to wake at night one or more times to void” (1,2). Nocturia is the most common of the lower urinary symptoms (2) and affects the patient’s quality of life.

Abnormal elevation in the frequency of night-time urination may be caused by a nocturnal reduction of bladder capacity, increased nocturnal urine production or a combination of both (3).

It has been reported that 4% of children (between 7 and 15 years of age) present with nocturia (4). Prevalence varies with the advance of age (3). In relation to sex, nocturia presents in 58% of women between the ages of 50 and 59 years and in 72% above 80 years of age. In men of the same ages nocturia presents in 66 and 91%, respectively (5). Elevated nocturia prevalence goes hand in hand with the average decrease in mictional volume and the increase of urinary frequency in both sexes (3).

Kari A.O. and cols. reported that general nocturia prevalence in both sexes is 40%. However, from the age of 50 years, nocturia risk per year is 7.3% in men and 3.5% in women (6).

A bladder diary is a fundamental clinical tool which has been underused despite the fact that it involves no monetary expense, it confirms uroflowmetry and urodynamic results and it is easy to carry out when its importance is understood by the patient. A bladder diary gives relevance to urinary symptomatology, adding events such as urgency, pain, incontinence episodes and protective napkin use, among others (7). It should be carried out for at least 2 days, preferably 72 hours, and should include the amount of liquid ingested in 24 hours (2), the mean urine volume that is voided, urinary frequency, the time the patient wakes up in the morning and goes to bed at night, the amount of urine voided in 24 hours and nocturia (3,7).

The bladder diary provides information that can be helpful in distinguishing whether the nocturia is caused by a nocturnal reduction of bladder capacity or elevated nocturnal urine production or both (3).

There are no local reports correlating urinary volumes and nocturia.

The objective of the present study was to report the relation between 24-hour urinary volume and nocturia in patients with complaints of lower urinary symptoms in Cd. Delicias, Chihuahua, Mexico.

MATERIALS AND METHODS

The case records of patients complaining of lower urinary symptomatology from January 2000 to December 2007 were reviewed. The following variables were registered: age, sex, urinary flowmetry, Qmax and 72-hour bladder diary with the notation “bedtime hour” and “waking
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**Figure 1. Bladder Diary.** The bladder diary should include a 48 to 72 hour register of liquid ingested, urinary volume, frequency, incontinence, accidents, napkin changes, bedtime hour and waking hour. (Figure 1). Nocturia was defined as “the complaint that the individual has to wake at night one or more times to void”.

Using the ICS definition of polyuria as “urinating more than 2800cc in 24 hours” or 40cc/kg of weight/24 hrs the sample was divided into 2 groups:

- **CONTROL GROUP (CG):** 24-hour urinary volume < 2.8 liters
- **POLYURIA GROUP (PG):** 24-hour urinary volume ≥ 2.8 liters

**Statistical Analysis:** Data was analyzed using the chi-square probability model for qualitative variables and the Student t test for numerical variables. Statistical significance was considered when $P < 0.05$. SPSS 10.0 commercial statistical software was used.

**RESULTS**

From the total of case records, 237 contained all the required information. There were 179 men and 58 women.

The CG consisted of 208 controls with a mean age of 49.9 years (SD 20.53), mean 24-hour urinary volume (M24UV) was 1499.08cc (SD 611.70) and mean Qmax was 14.456cc/sec. (SD 7.744). Of the controls 75% corresponded to men (156/208) and 25% to women (52/208) and nocturia presented in 94% (196/208).

The PG consisted of 29 cases with a mean age of 54.97 years (SD 15.95), M24UV of 3570.14 cc (SD 667.17) and a mean Qmax of 16.086 cc/sec. (SD 8.432). Of the polyuria cases 79.31% corresponded to men (23/29) and 20.68% (6/29) to women and nocturia presented in 96.55% (28/29).
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Polyuria and nocturia association results were as follows: prevalence in cases was 0.9 and in controls was 0.8; there was an OR of 3.1 with a CI of 0.4 – 24.3 and a \( P = 0.4 \), indicating there was no statistically significant association between polyuria and nocturia.

In the case and control comparison the cut-off point was more than one nocturnal urination. Results showed an OR of 1.5 with a CI of 1.6 - 3.72 and a \( P= 0.20 \), indicating there was no statistically significant difference between the two groups (Figure 2).

**DISCUSSION**

There was no statistically significant difference between the two groups in relation to sex (\( P = 0.284 \)) or Qmax (\( P = 0.16 \)). Mean Qmax 14.456 cc/sec in the CG and mean Qmax de 16.086 cc/sec in the PG showed an absence of infravesical obstruction. There was no statistically significant association between polyuria and nocturia between the two groups.

There was a proportionally greater number of polyuria cases in Group 2 (nocturia) (2800cc urinary volume or greater) compared with Group 1 (no nocturia). The Odds Ratio for nocturia probability in the presence of polyuria was 3.1 in our series.

**CONCLUSIONS**

It is necessary to corroborate whether or not nocturia is related to polyuria by verifying 24-hour urinary volumes. This will increase the clinical value of the bladder diary in lower obstructive uropathy diagnosis. In our series the OR probability of presenting with nocturia was 3.1 in the presence of polyuria and in the absence of lower obstructive uropathy. This information can help the physician explain to patients presenting with polyuria that this symptom is not necessarily related to lower obstructive uropathy.

**BIBLIOGRAPHY**